CREATE-IoT

European Large-Scale Pilots Programme

IoT and Smart Cities: Personal Data Protection Strategies and Guidelines

IoT Week Bilbao 2018
4-7 JUNE 2018, BILBAO (SPAIN)
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Antonio Kung, Trialog, France
Mara Balestrani, Ideas for change, Spain

IOT4SCC: Joint Workshop on IoT for Smart Cities & Communities Platform Convergence: Breakout C, 7 June 2018

Outline on Session on Personal Data Protection Strategies and Guidelines

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Session 1 (12.30 - 13.30)

- Citizen viewpoint for smart cities
  - Mara Balestrami, Ideas for change
- Privacy-by-design viewpoint for smart cities
  - Antonio Kung, Trialog
- Introduction to smart city use case session
- Selection of smart city use case

Session 2 (14.30-15.30)

- Legal and ethical compliance viewpoint for smart cities
  - Pasquale Annicchino, Archimede Solutions
- Smart city use case session
  - Breaches
  - Threats and consequences
  - Measures
- Conclusion

Citizen viewpoint for smart cities

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Privacy-by-design Viewpoint for Smart Cities

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Antonio Kung

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- European projects: PRIPARE, Create-IoT…
- IPEN wiki (ipen.trialog.com)
- EIP-SCC Citizen approach to data: privacy-by-design
  - Workshop London (March 2017)
  - Workshop Milan (July 2017)
  - Workshop Brussels – Eurocities (January 2018)
- Involved in standardisation
  - ISO/IEC 27570 - Privacy guidelines for smart cities
  - ISO/IEC 27030 - Security and privacy guidelines for IoT
  - ISO/IEC 27550 - Privacy engineering for system life cycle processes
  - ISO/IEC 30147 - Methodology for implementing and maintaining trustworthiness of IoT systems and services
  - ISO/IEC 20547-4 – Big data reference architecture – Security and privacy

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ICT Trend towards Complex Ecosystems

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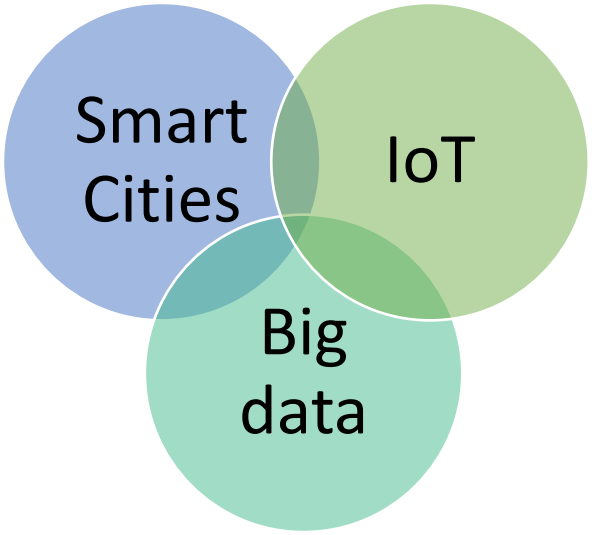
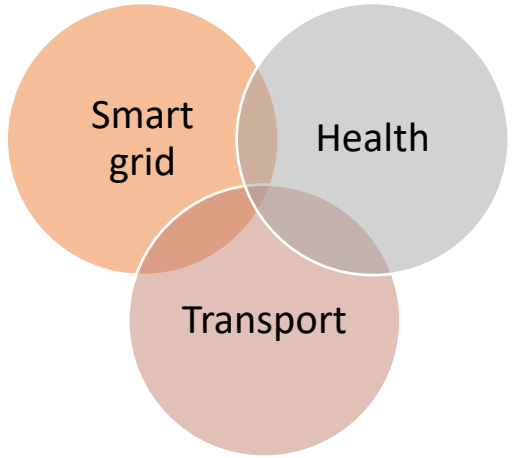
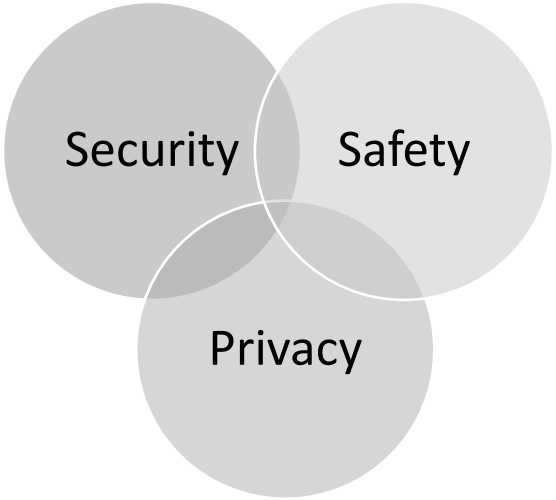


Ecosystems



Domains



Concerns

Smart Cities Deal with Ecosystems

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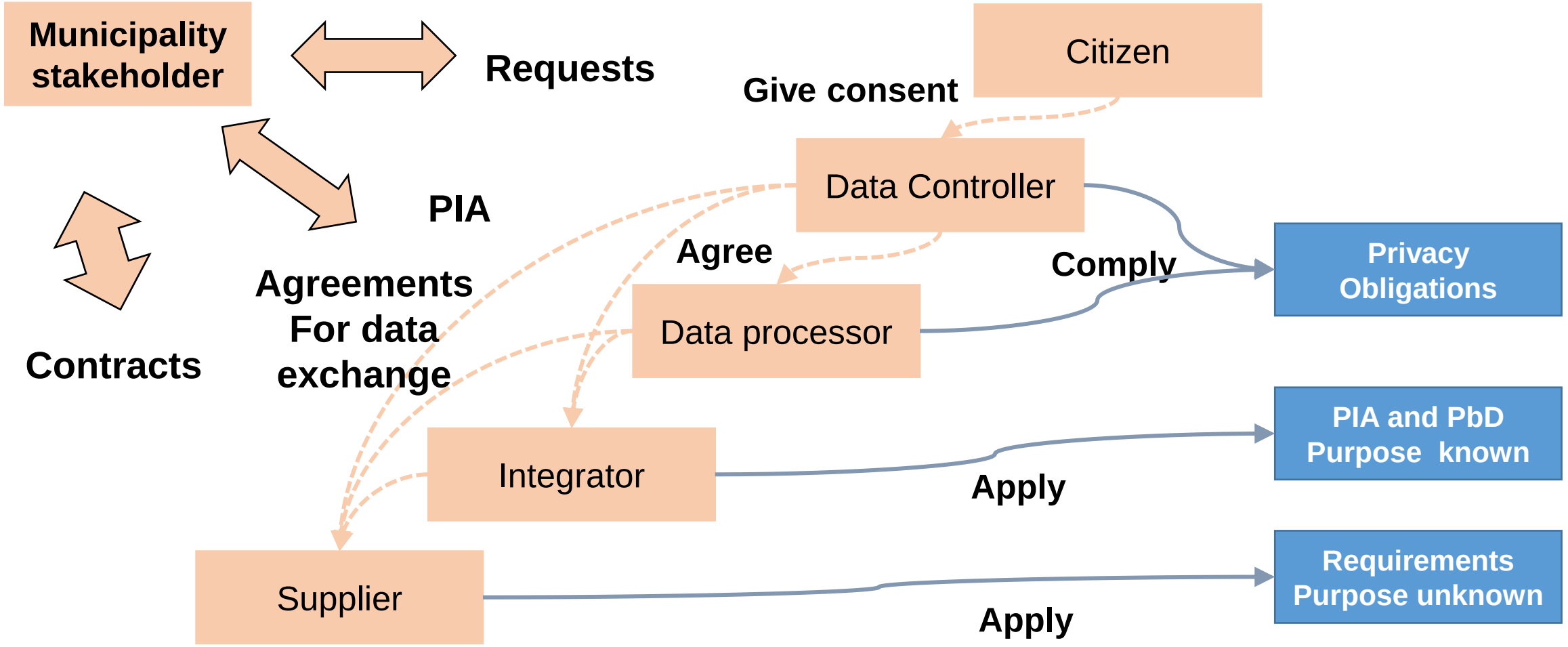

Ecosystems Involve Supply Chains

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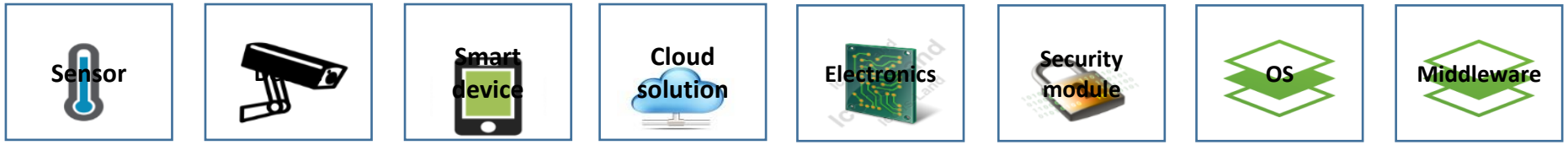
Operator
Application 1

Operator
Application 2

Integrator

Supplier



Supply Chain

Ecosystems Involve Business Exchange

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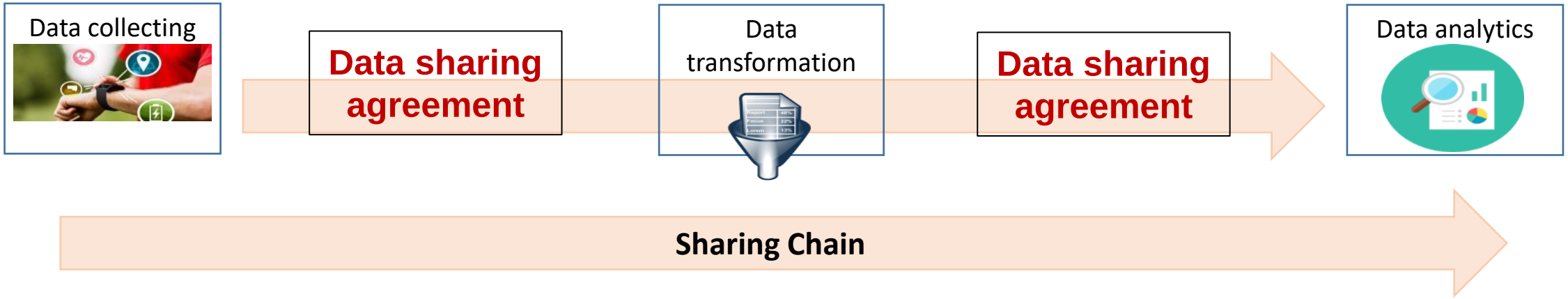

Example of Big Data Ecosystem: AutoMat

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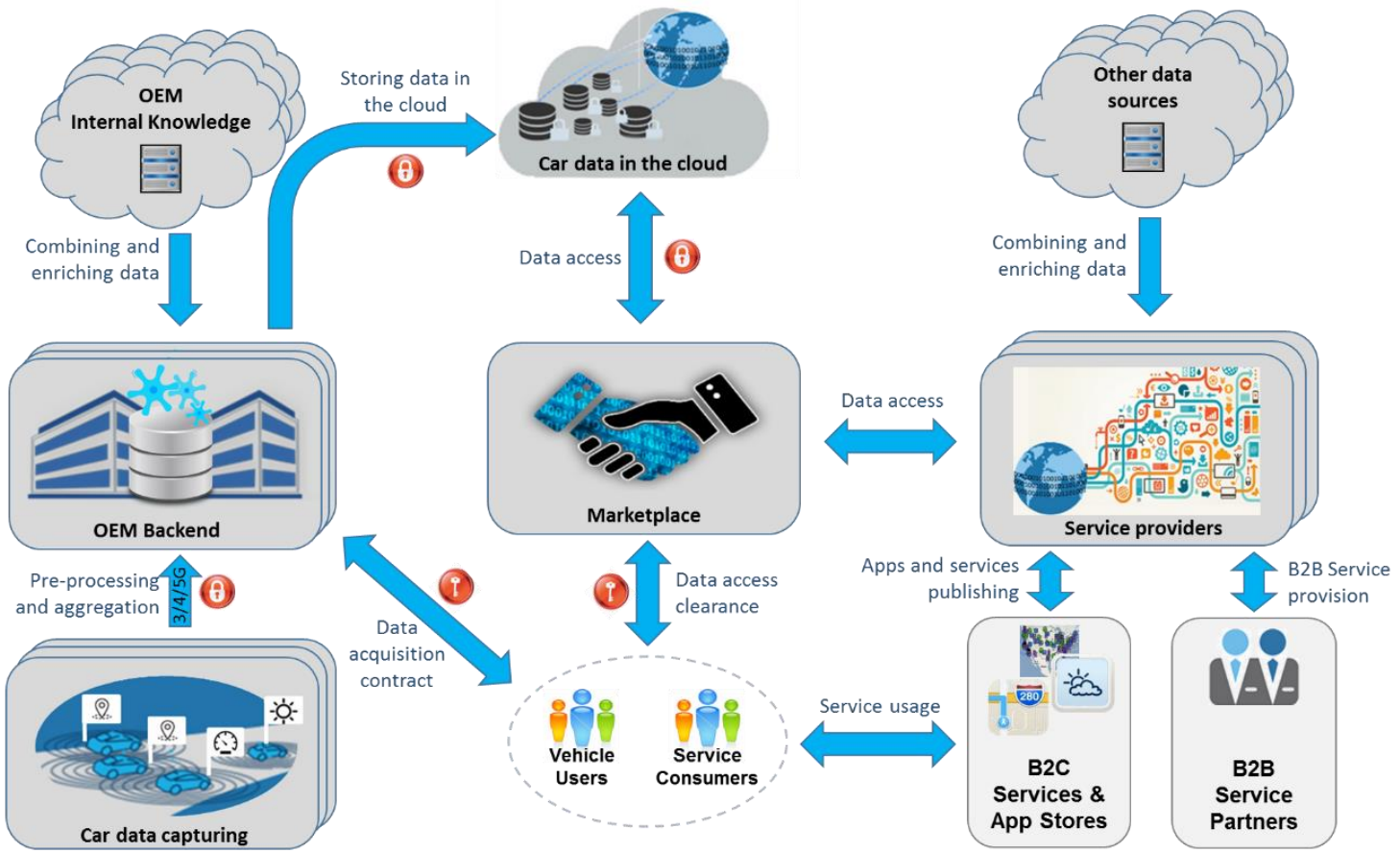

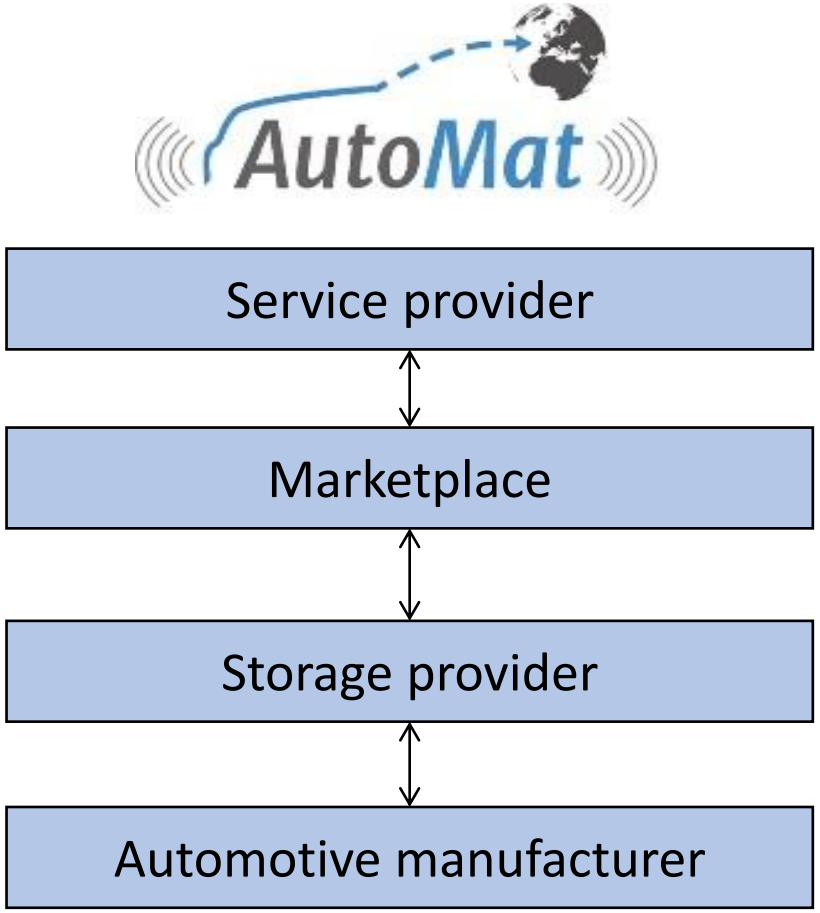

Need to coordinate between ecosystem stakeholders

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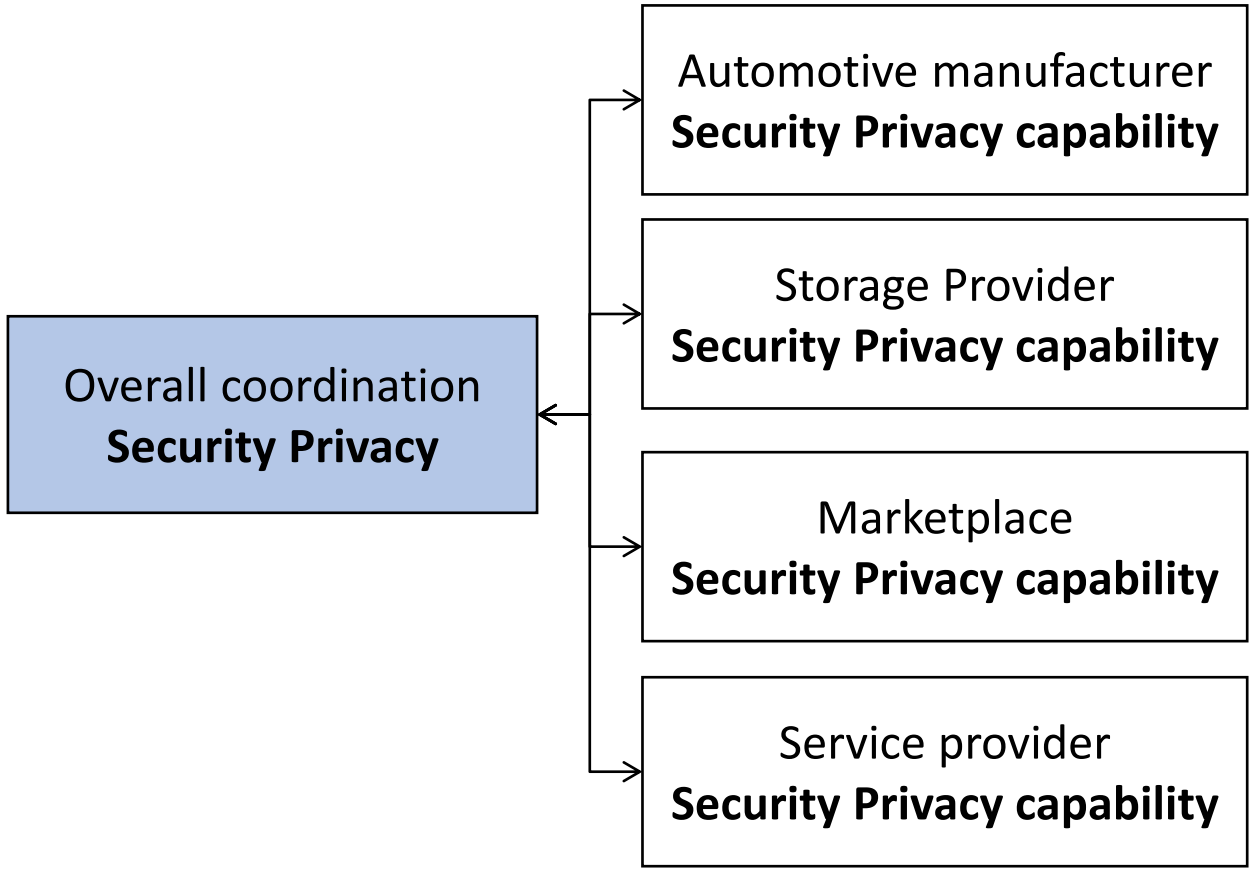
- Example of coordination needs
  - Privacy compliance
    - Global privacy impact assessment vs organisation PIA
    - PII tracking e.g. upon user consent removal
    - Data breach management
  - Cybersecurity compliance
    - Global risk analysis vs organisation risk analysis
    - Cybersecurity incident management



Impact on Standards Landscape

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Additional guidelines For ecosystems

Privacy Standards for Smart Cities
27570 Privacy guidelines

Privacy Standards for Big Data
20546-4 Security and privacy

Privacy Standards for IoT
27030 Security and privacy guidelines

General Privacy Standards
Privacy framework 29100
Privacy impact assessment 29134
Privacy engineering 27550
Code of practice 29151
Privacy Information management systems 27552
OASIS-PMRM

Thank You!

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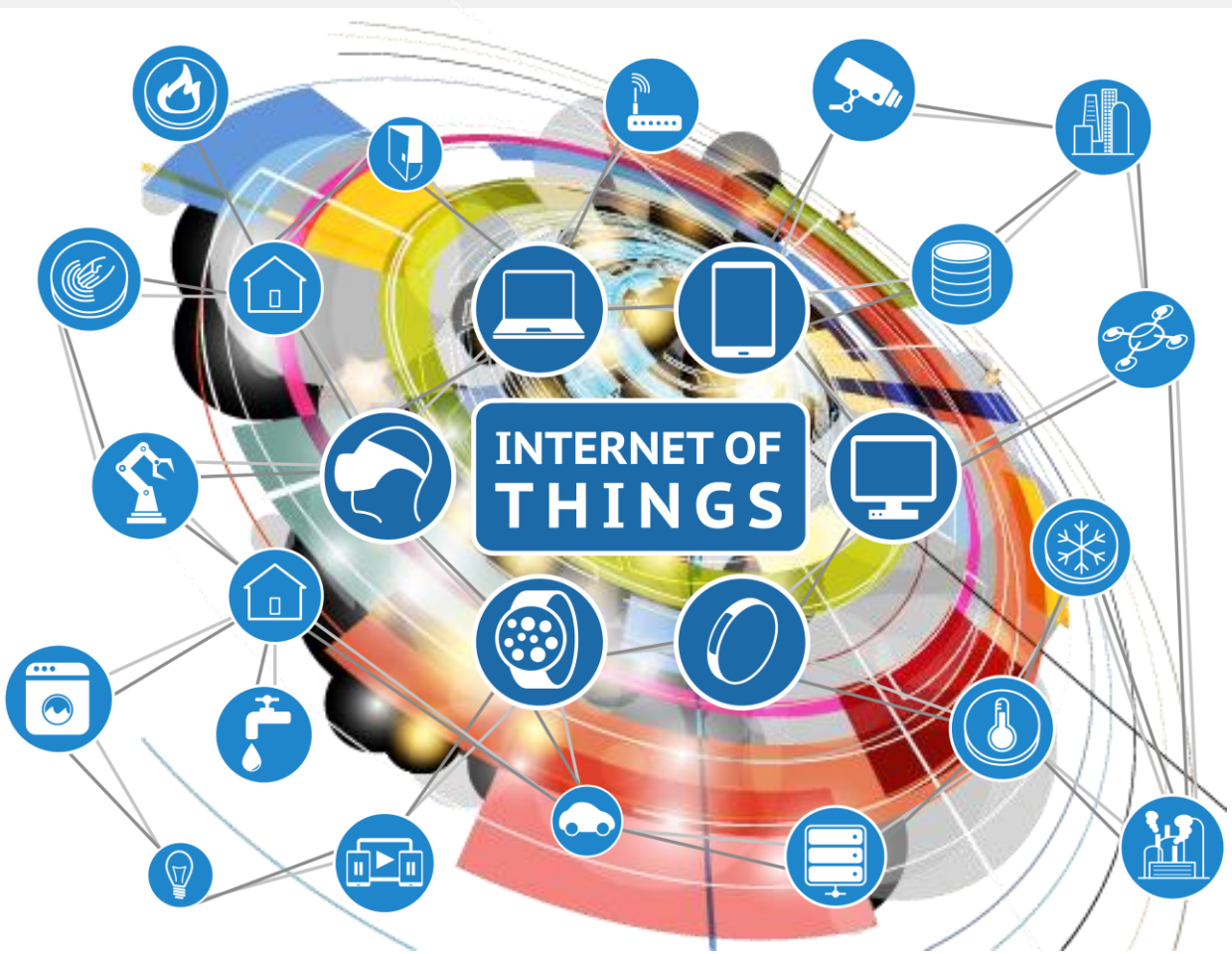

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Introduction to smart city use case session

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Context

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- Many such sessions carried out since 2017
- Participative approach
  - Citizen, Policy makers, Engineers
- Templates based on standards
- Content : impact analysis
  - Breaches
  - Threats and consequences
  - Measures

Security and privacy assessment (based on ISO/IEC 27550)

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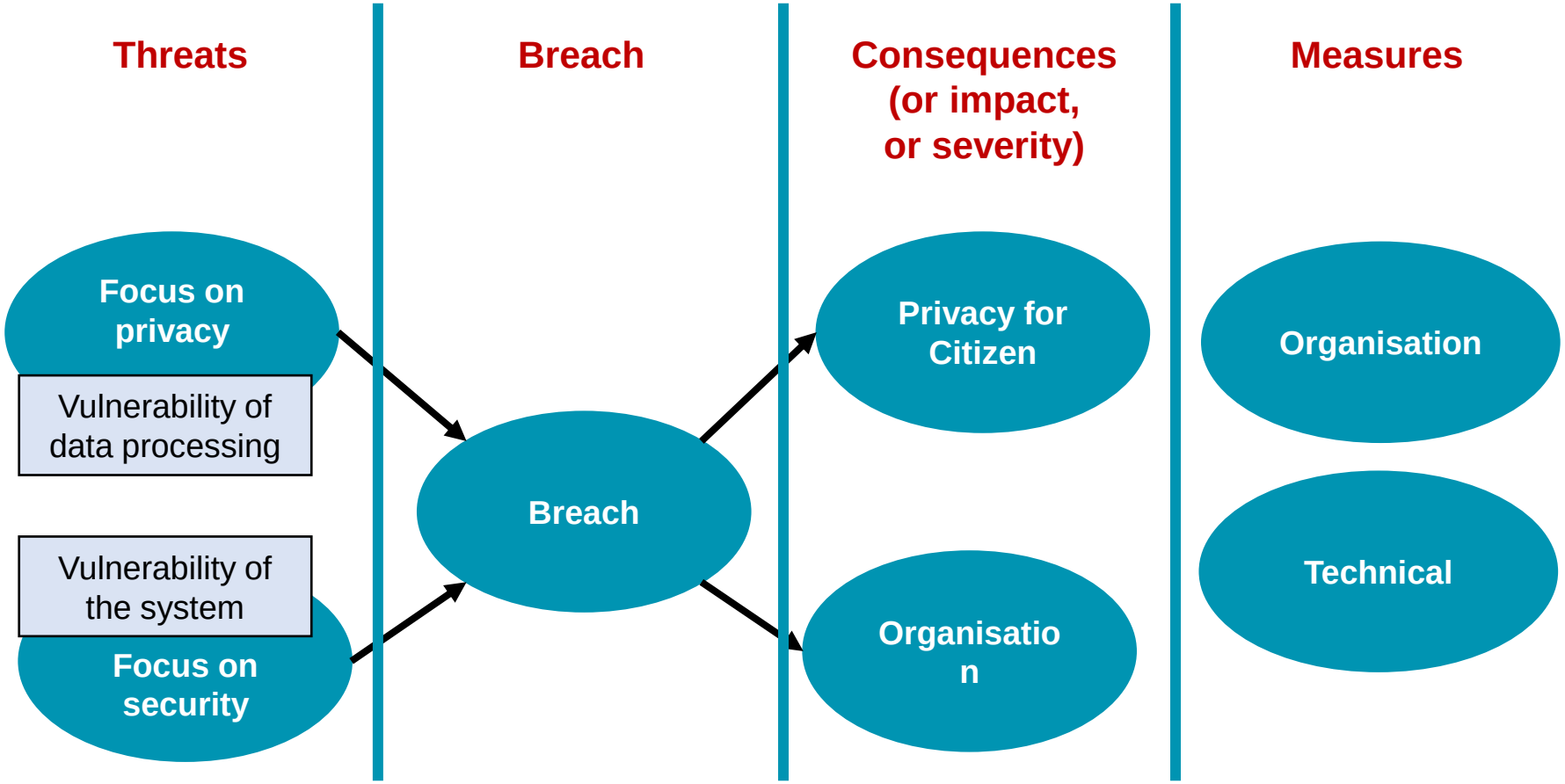

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Threats (based on LINDDUN and STRIDE)

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Property	Threat
Unlinkability	**L**inkability
Anonymity	**I**dentifiability
Plausible deniability	**N**on-repudiation
Undetectability and unobservability	**D**etectability
Confidentiality	**D**isclosure of information
Content awareness	**U**nawareness
Policy and consent compliance	**N**on compliance

Property	Threat
Authentication	**S**poofing
Integrity	**T**ampering
Nonrepudiation	**R**epudiation
Confidentiality	**I**nformation disclosure
Availability	**D**enial Of Service
Authorization	**E**levation of privilege

Risk map (based on CNIL guidelines)

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Maximum Impact	Must be avoided or reduced		A O Absolutely avoided or reduced	
Significant Impact				
Limited Impact	These risks may be taken		Must be reduced	
Negligible Impact				
	Negligible Likelihood	Limited Likelihood	Significant Likelihood	Maximum Likelihood

Example

- Breach: Alice attendance is made public
- Threat and consequence
  - Treat: Some one hacks into the attendance management system and retrieves the log of attendance
  - Consequence
    - Likelihood significant
    - Impact
      - for Alice could be maximum
      - For the organisation could be significant

A

O

Security Measures (based on ISO/IEC 27000)

European

Category	Sub-categories
Policies	Management direction
Organization	Internal organisation Mobile devices and teleworking
Human resource security	Prior to employment During employment Termination and change of employment
Asset management	Responsibility for assets Information classification
Access control	Business requirements of access control User access management User responsibilities System and application access control Media handling
Cryptography	Cryptographic controls
Physical and environmental security	Secure areas Equipment

Category	Sub-categories
Operation security	Operational procedures and responsibilities Protection from malware Backup Logging and monitoring Control of operational software Technical vulnerability management Information systems audit considerations
Communication security	Network security management Information transfer
System acquisition, development and maintenance	Security requirements Security in development processes Test data
Suppliers relationships	Security in supplier relationships Supplier service delivery management
Incident management	Management of incidents and improvements
Business continuity	Information security continuity Redundancies
Compliance	Compliance (legal and contractual) Information security reviews

Privacy measures: data controllers (based on ISO/IEC 27552)

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Category	Control
Conditions for collection and processing	Identify and document purpose
	Identify lawful basis
	Determine when and how consent is to be obtained
	Obtain and record consent
	Privacy impact assessment
	Contracts with PII processors
	Records related to processing PII
Rights of PII principals	Determining PII principals rights and enabling exercise
	Determining information for PII principals
	Providing information for PII principals
	Provide mechanism to modify of withdraw consent
	Provide mechanism to object to processing
	Sharing the exercising of PII princ
	Correction or erasure
	Providing copy of PII processed
	Request management
	Automated decision taking

Privacy-by-design and by-default	Limit collection
	Limit processing
	Define and document PII minization and de-identification objectives
	Comply with data minimization and de-identification use
	PII de-identification and deletion
	Temporary failes
	Retention
	Disposal
	Collection procedures
	PII transmission controls
PII sharing, transfer and disclosure	Identify basis for PII transfer
	Countries and organisations to which PII might be transferred
	Records of transfer of PII
	Records of PII disclosure to third parties
	Joint controller

Privacy measures: data processors (based on ISO/IEC 27552)

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Category	Control
Conditions for collection and processing	Cooperation agreement
	Organization's purposes
	Marketing and advertising use
	Infringing instruction
	PII controller obligations
	Records related to processing PII
Rights of PII principals	Obligations to PII principals
Privacy-by-design and by-default	Temporary files
	Return transfer or disposal of PII
	PII transmission controls
PII sharing, transfer and disclosure	Basis for transfert of PII
	Countries and organisations to which PII might be transferred
	Records of PII disclosure to third parties
	Notification of PII disclosure requests
	Legally binding PII disclosures
	Disclosure of subcontractors used to process PII
	Engagement of a subcontractor to process PII
	Change of subcontractor to process PII

The five Results of a Workshop

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[1] Description of system component, data flow, data process	**[2] Breaches, Threats and consequences**
[3] Risk map	**[4] Measures**
[5] Conclusions / Actions	

Thank You!

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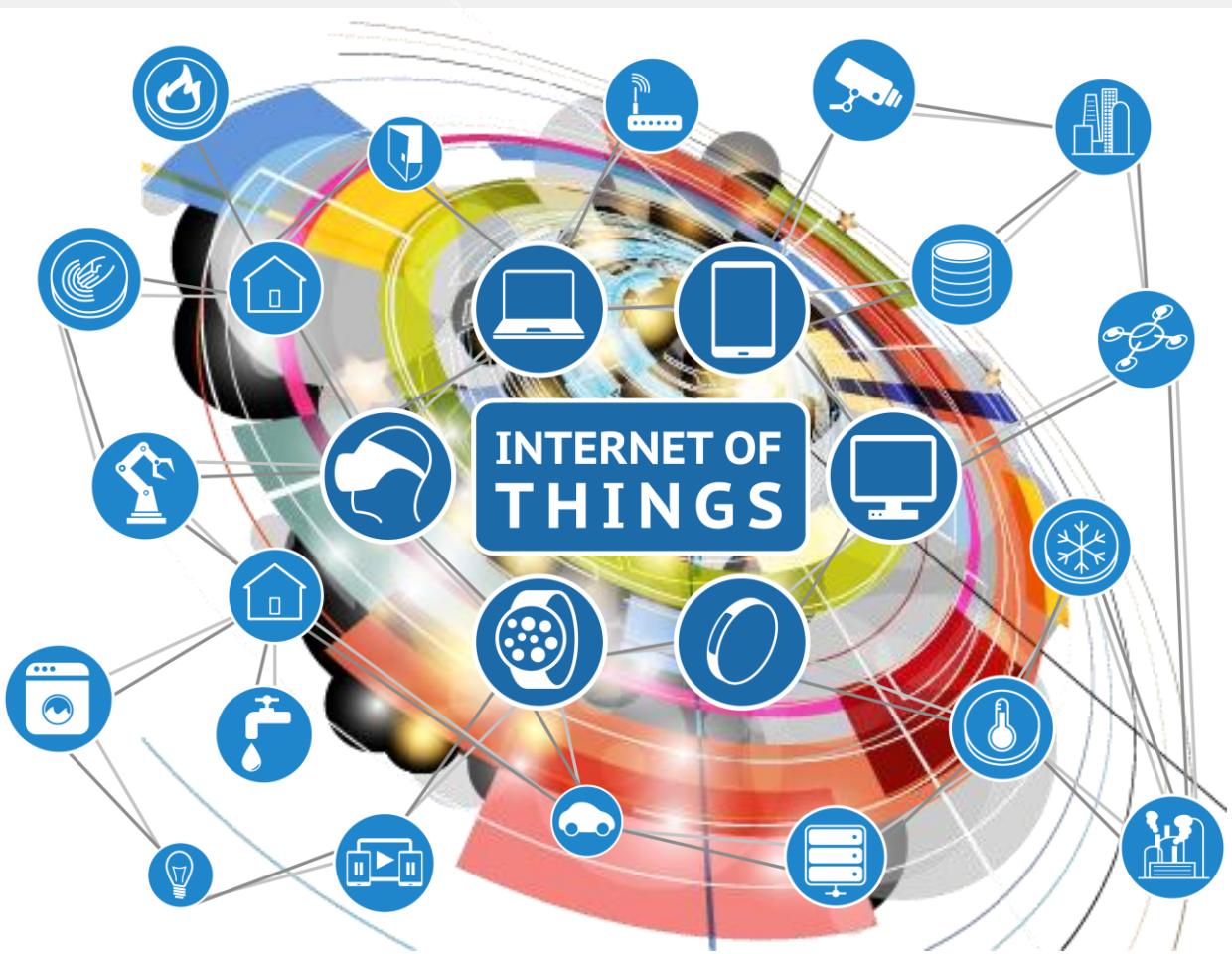

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Selection of Use Case

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Use case

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- Open data
- This part to be filled out with the audience

Legal and Ethical Compliance Viewpoint for Smart Cities

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Pasquale Annicchino, Archimede Solutions, Switzerland

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Smart city use case session: Breaches

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Use Case Breaches

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- Open data use case
  - Massive data leak
- This part to be filled out with the audience

Smart city use case session: Threats and Consequences

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Use Case Threat and Consequences

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- Open data use case
  - Weak anonymization
- This part to be filled out with the audience

Maximum Impact	Must be avoided or reduced		Absolutely avoided or reduced	
Significant Impact				
Limited Impact	These risks may be taken		Must be reduced	
Negligible Impact				
	Negligible Likelihood	Limited Likelihood	Significant Likelihood	Maximum Likelihood

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Smart city use case session: Measures

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Use Case Measures

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- Open data use case
  - Set up an incident management scheme
- This part to be filled out with the audience

Security Measures for Use Case

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Privacy measures for Use Case: data controllers

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Smart city use case session: Conclusions

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Conclusion

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- Open data use case
  - Set up an incident management scheme
- This part to be filled out with the audience

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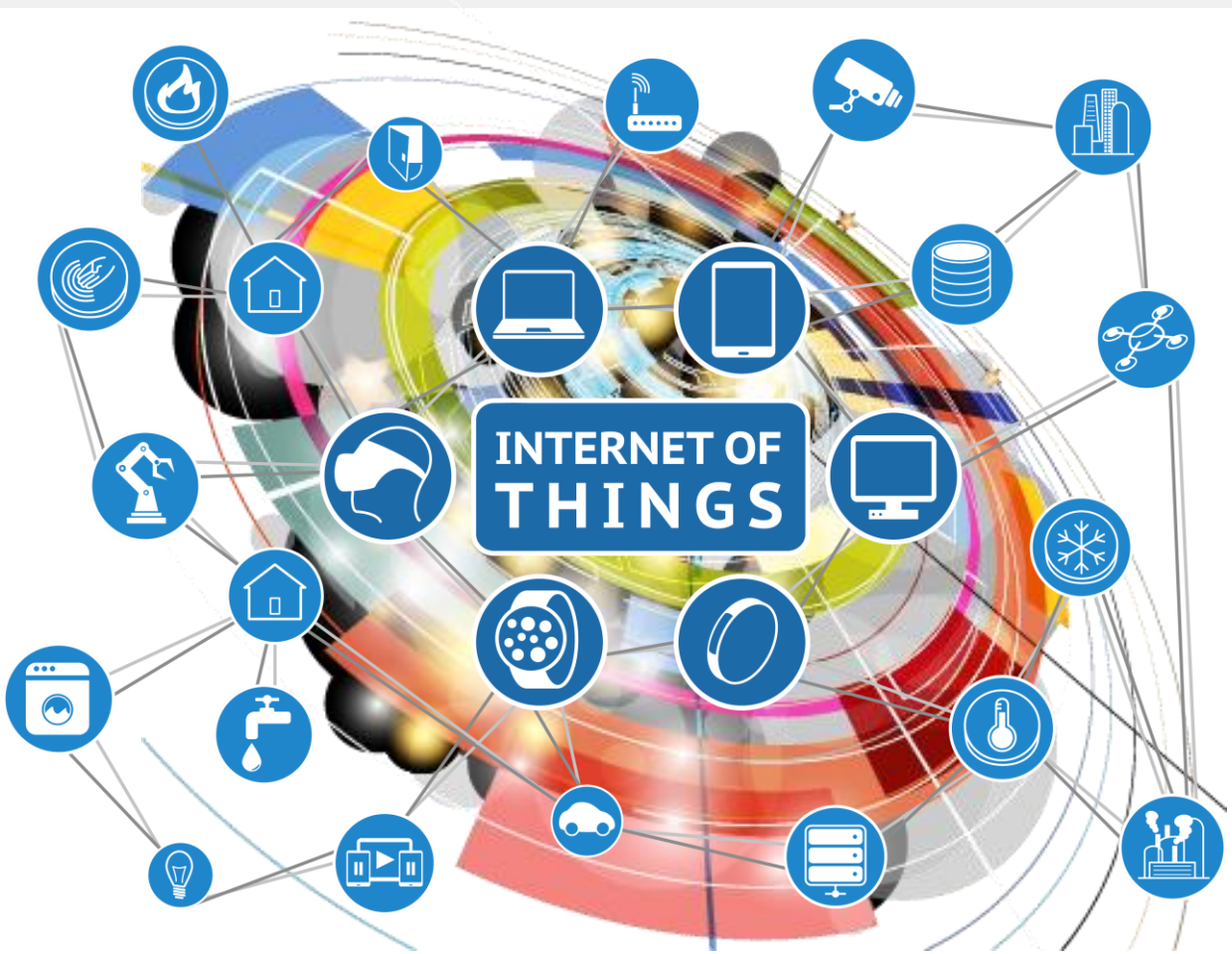

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